

**UNITED STATES PATENT APPLICATION**

**OF**

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**FOR**

**ASSEMBLY OF SUPPLYING DETERGENT IN WASHING  
MACHINE**

[0001] This application claims the benefit of Korean Application(s) No. 10-2002-0074972 filed on November 28, 2002, which is/are hereby incorporated by reference.

## BACKGROUND OF THE INVENTION

### 5 Field of the Invention

[0002] The present invention relates to an assembly of supplying a detergent in a washing machine, by which a detergent box is correctly installed in the washing machine.

### Discussion of the Related Art

[0003] Generally, a washing machine dips a laundry in a detergent-dissolving water  
10 to eliminate filth involved in the laundry by chemical reaction of detergent. Moreover, the filth is eliminated by mechanical friction between the laundry and water using a water current.

[0004] FIG. 1 is a perspective view of a washing machine according to a related art.

[0005] Referring to FIG. 1, the laundry is put in a drum 4 via an opening h at a front panel 3, and a washing course is controlled by an operation of a control panel 20. A door 9 is  
15 provided over the opening 6 to open/close the opening h for the drum 4. A drawer panel 16 having a grip 15 attached thereto is provided at one side of the control panel 20, and a detergent box is provided in rear of the drawer panel 16. A cabinet 2 is provided at lateral sides of the washing machine, and a top cover 1 is provided on the cabinet 2.

[0006] Water is supplied via an inlet pipe 6 in rear of the cabinet, and the used water  
20 is drained through a drainpipe 8 in a lower rear part of the washing machine.

[0007] FIG. 2 is a perspective view of a disassembled detergent supply assembly of a washing machine according to a related art.

[0008] Referring to FIG. 1 and FIG. 2, in a detergent supply assembly according to a related art, a detergent box is inserted in a receiving part provided at one side of the control

panel 20. One end of the inlet pipe 6 is connected to a rear side of the receiving part. A multitude of shower holes (not shown in the drawing) are formed at one end of the inlet pipe 6. An opening 20a is formed at a front side of the receiving part 12, and the detergent box 14 is inserted in the receiving part 12 through the opening 20a.

5       **[0009]**   The drawer panel 16 constructing an exterior of the drum type washing machine is installed in front of the detergent box 14. And, the detergent box 14 is held in the receiving part 12.

10       **[0010]**   After the detergent box 14 storing a detergent has been received in the receiving part 12, a water supply mode is selected so that water is supplied to the receiving part 12 via the inlet pipe 6. As the water is injected via the shower holes at one end of the inlet pipe 6 into the detergent box 14, the detergent is showered by the injected water to flow in the drum 4 via a rear side opening of the detergent box 14. While the detergent and water flow in the drum 4, the detergent is partially dissolved in the water.

15       **[0011]**   The detergent supply assembly including the detergent box 14 and the receiving part 12 is formed of a plastic-based material by injection molding.

**[0012]**   However, in the related art detergent supply assembly of the washing machine, an error takes place on inserting the detergent box in the receiving part, whereby the detergent 14 fails to be accurately inserted in the receiving part 12.

20       **[0013]**   In case that the detergent fails to be accurately inserted, the detergent is unable to be smoothly supplied.

**[0014]**   Moreover, in receiving the detergent box 14, a step difference is generated between the drawer panel 16 and the control panel 20 to spoil an exterior image.

## SUMMARY OF THE INVENTION

[0015] Accordingly, the present invention is directed to an assembly of supplying a detergent in a washing machine that substantially obviates one or more of the problems due to limitations and disadvantages of the related art.

5 [0016] An object of the present invention, which has been devised to solve the foregoing problem, lies in providing an assembly of supplying a detergent in a washing machine, by which a detergent box can be correctly installed in the washing machine.

[0017] Additional features and advantages of the invention will be set forth in the description which follows, and in part will be apparent to those having ordinary skill in the art upon examination of the following or may be learned from a practice of the invention. The  
10 objectives and other advantages of the invention will be realized and attained by the subject matter particularly pointed out in the specification and claims hereof as well as in the appended drawings.

[0018] To achieve these objects and other advantages in accordance with the present  
15 invention, as embodied and broadly described herein, there is provided an assembly of supplying a detergent in a washing machine including a receiving part provided in an upper space of the washing machine to have an opening at a front side, a detergent box detachably received in the receiving part via the opening, a drawer panel installed at a front side of the detergent box to form an exterior of the washing machine, and a location correction means for  
20 correction a reception location of the detergent box.

[0019] Preferably, a plate having an entrance for drawing the detergent box is further provided to the opening of the receiving part. Moreover, a control panel is provided to a side of the receiving part and the plate is recessed inward to be built in one body of the control panel.

[0020] In this case, the location correction means includes a location correction protrusion protruding from the plate in a front direction to be built in one body of the plate and a location correction recess at a rear side of the drawer panel to have the location correction protrusion inserted therein.

5 [0021] And, the location correction protrusion is plurally provided to the plate to leave a predetermined distance from each other and the location correction recess is plurally provided to the drawer panel to confront the corresponding location correction protrusion.

[0022] Moreover, a protrusion is formed along a circumference of the location correction protrusion and a groove is formed at an inside of the location correction recess to  
10 correspond to the protrusion. In this case, the protrusion is formed of a resin-based material to be built in one body of the location correction protrusion.

[0023] Meanwhile, a plurality of detergent storing parts are partitioned in the detergent box. Moreover, a guide panel is provided to a lateral side of the detergent box and a guide groove is formed at an inner lateral side of the receiving part to have the guide panel  
15 inserted to slide.

[0024] And, one end of an inlet hose of water is connected to a rear side of the receiving part and a multitude of shower holes are formed at the one end of the inlet hose for supplying the water to the detergent box.

[0025] Besides, a grip is provided at a front side of the drawer panel.

20 [0026] In another aspect of the present invention, the location correction means includes a location correction protrusion protruding in a front direction from a portion in the vicinity of the opening of the receiving part and a location correction recess at a rear side of the drawer panel to have the location correction protrusion inserted therein.

[0027] In this case, the location correction protrusion is plurally provided to the plate

to leave a predetermined distance from each other and the location correction recess is plurally provided to the drawer panel to confront the corresponding location correction protrusion.

[0028] Moreover, a protrusion is formed along a circumference of the location correction protrusion and a groove is formed at an inside of the location correction recess to correspond to the protrusion. And, the protrusion is formed of a resin-based material to be built in one body of the location correction protrusion.

[0029] It is to be understood that both the foregoing explanation and the following detailed description of the present invention are exemplary and illustrative and are intended to provide further explanation of the invention as claimed.

#### BRIEF DESCRIPTION OF THE DRAWINGS

[0030] The accompanying drawings, which are included to provide a further understanding of the invention and are incorporated in and constitute a part of this application, illustrate embodiment(s) of the invention and together with the description serve to explain the principle of the invention. In the drawings:

[0031] FIG. 1 is a perspective view of a washing machine according to a related art;

[0032] FIG. 2 is a perspective view of a disassembled detergent supply assembly of a washing machine according to a related art;

[0033] FIG. 3 is a perspective view of a washing machine according to the present invention;

[0034] FIG. 4 is a perspective view of a disassembled detergent supply assembly of a washing machine according to the present invention; and

[0035] FIG. 5 is a cross-sectional view along a bisecting line 'A-A' in FIG. 3.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT(S)

[0036] Reference will now be made in detail to the preferred embodiment(s) of the present invention, examples of which are illustrated in the accompanying drawings. Throughout the drawings, like elements are indicated using the same or similar reference designations where possible.

[0037] FIG. 3 is a perspective view of a washing machine according to the present invention, FIG. 4 is a perspective view of a disassembled detergent supply assembly of a washing machine according to the present invention, and FIG. 5 is a cross-sectional view along a bisecting line 'A-A' in FIG. 3.

[0038] Referring to FIG. 3, a washing machine according to the present invention includes a cabinet 52, a drum 74, a control panel 70, an inlet hose 72, and outlet hose 58, and a detergent supply assembly.

[0039] The cabinet 52 is provided to lateral sides and a rear side of the washing machine, and a top cover 51 is provided to cover a top of the washing machine. A front panel 53 is provided to a front side of the cabinet 52 to cover to a predetermined height. And, an opening h is formed at the front panel 63.

[0040] The opening h is provided as a passage via which a laundry is put in the drum 74, and is closed/opened by a door installed at one side of the opening h.

[0041] The inlet hose 72 for supplying water is provided in rear of the cabinet 52 to be connected to an inside of the washing machine. The outlet hose 58 for draining the water after washing is provided at one lower side of the washing machine.

[0042] The control panel 70 and a drawer panel 58 are provided at an upper side of the front panel 53. An electronic unit (not shown in the drawing) for controlling an operation

of the washing machine and displaying an operational status of the washing machine is installed in the control panel 70. The drawer panel 58 is provided at one side of the control panel 70. A plate 71 having a detergent box entrance 71a is formed in rear of the drawer panel 58. And, a receiving part 54 for holding the detergent box 56 is provided in rear of the plate 71.

[0043] The detergent supply assembly for storing and supplying the detergent is provided to a rear side of the drawer panel 58. The detergent supply assembly includes the detergent box 56, the receiving part 54, and a location correction means.

[0044] Referring to FIG. 4, the receiving part 54 is formed in rear of the drawer panel 58, and the receiving part 54 is connected to one end of the inlet hose 72 for guiding the water. The plate 71 having the detergent box entrance 71a is provided to a front side of the receiving part 54, and the detergent box 56 for storing the detergent is detachably installed through the entrance 71a. The drawer panel 58 installed at the front side of the detergent box 56 forms a front exterior of the washing machine when the detergent box 56 is held in the receiving part 54.

[0045] Meanwhile, a front side of the receiving part 54 communicates with an external environment via the detergent box entrance 71a, and guide rails (not shown in the drawing) are provided to lateral insides of the receiving part 54 so that guide panels 56a formed at both sides of the detergent box 56 are inserted to slide. An inner upper side of the receiving part 54 is connected to one end of the inlet hose 72, and a multitude of shower holes (not shown in the drawing) are formed at the one end to inject the water downward. Hence, the water injected into the detergent box 56 through the shower holes connected to the receiving part 54 is put in the drum 74 inside the cabinet 52 together with the detergent stored in the detergent box 56.



[0046] The detergent box 56 is box-figured to have open top and rear sides, and an inside of the detergent box 56 is partitioned into a plurality of detergent storing parts 56b. The detergent box 56 slides in and out through the entrance 71. And, a grip 59 is formed at a front side of the drawer panel 58 to facilitate a user to draw out the detergent box 56.

5 [0047] Meanwhile, the drawer panel 58 should have a continuous exterior with the control panel 70 when the detergent box 56 is held in the receiving part 54.

[0048] However, in the related art washing machine, the injection molding for the detergent box 56 or the guide panels 56a was incorrect or the detergent box 56 is incorrectly located in the receiving part 54 when a user inserts the detergent box 56 in the receiving part  
10 54. In such cases, the detergent fails to be smoothly supplied and a step difference between the control panel 70 and the drawer panel 58 takes place to spoil the exterior beauty.

[0049] In order to guarantee the correct reception of the detergent box 56 and to prevent the step difference between the drawer panel 58 and the cabinet 52 from spoiling the exterior beauty, the location correction means is provided. The location correction means is  
15 provided at confronting portions of the drawer panel 58 and the receiving part 54 so that the detergent box 56 is correctly received in the receiving part 54.

[0050] The location correction means includes a location correction protrusion 62 and a location correction recess 58a.

[0051] The location correction protrusion 62 protrudes toward the drawer panel 58  
20 from one side of the receiving part 54. The location correction protrusion 62 is preferably formed at the plate 71 installed in front of the receiving part 54. In this case, the plate 71 is built in one body of the control panel 70 recessed inward to be provided to the side of the receiving part 54.

[0052] The location correction recess 58a, in which the location correction protrusion

62 is inserted when the detergent box 56 is received, is formed at a portion of the rear side of the drawer panel 58 confronting the location correction protrusion 62.

[0053] The location correction recess 58a is preferably formed to have a thickness and a length enough to support the detergent box 56 and the drawer panel 58 to sustain the weight of the detergent box 56 and the drawer panel 58.

[0054] The location correction means corrects a coupling position between the detergent box 56 and the receiving part 54. Hence, even if the detergent box 56 is incorrectly inserted in the receiving part 54, the location correction protrusion 62 is inserted in the location correction recess 58a to guarantee the accurate reception of the detergent box 56 and the drawer panel 58.

[0055] If the coupling position between the detergent box 56 and the receiving part 54 is misaligned, the location correction protrusion 62 interrupts the drawer panel 58 and the detergent box 56 to move in a rear direction of the cabinet 52 so that the drawer panel 58 protrudes out of the control panel 70. Hence, a user enables to recognize that the coupling position between the drawer panel 58 and the control panel 70 is misaligned.

[0056] The location correction protrusion 62, as shown in FIG. 4, is formed at one upper side of the plate 71 having the entrance for the detergent box 56.

[0057] Moreover, in order to guarantee more accurate reception of the detergent box 56, at least two location correction protrusions 62 are preferably provided to the plate 71 to leave a predetermined distance from each other. Accordingly, at least two location correction recesses 58a are formed at the drawer panel 58 to correspond to the at least two location correction protrusions 62, respectively.

[0058] Meanwhile, a protrusion 62a, as shown in FIG. 5, protruding short on a circumference of the location correction protrusion is preferably formed. And, a groove is

formed at the location correction recess 58a to correspond to the protrusion 62a. When the location correction protrusion 62 is inserted in the location correction recess 58a, the protrusion 62a elastically contracts. After reaching the corresponding recess, the contracting protrusion 62a elastically expanding to restore is fitted to the corresponding recess to be fixed thereto. Hence, when the location correction protrusion 62 is inserted in the location correction recess 58a to have the detergent box 56 received in the receiving part 54 correctly, the user can feel the elastic deformation of the protrusion 62a to confirm the accurate fixing. In this case, the protrusion 62a is preferably built in one body of the location correction protrusion 62.

**[0059]** An operation of the detergent supply assembly in the washing machine is explained as follows.

**[0060]** First of all, before washing, a user grabs the grip 59 at the drawer panel 58 to draw out the detergent box 56, puts the detergent in the detergent storing parts 56b, and returns the detergent box 56 back to the receiving part 54.

**[0061]** In returning detergent box 56 to the receiving part, if the location correction protrusion 62 is inserted in the location correction recess 58a at the drawer panel 58, the continuous exterior is provided by the drawer panel 58 and the control panel 70. On the other hand, if the detergent box 56 fails to be correctly received in the receiving part 54, the location correction protrusion 62 is unable to be inserted in the location correction recess 58a. Hence, the user draws out the drawer panel 58 and detergent box 56n and then adjusts them correctly.

**[0062]** Meanwhile, while the detergent box 56 is received in the receiving part 54, if the inlet hose 72 is opened, the water is supplied to the passage of the receiving part 54 and is then injected downward via the shower holes.

[0063] In this case, since the detergent box 56 received in the receiving part 54 is disposed directly under the shower holes, the water is injected onto the detergent box 56 through the open top of the detergent box 56. Once the water is injected onto the detergent box 56, the detergent stored in the detergent box 56 flows in the receiving part 54 via the open rear side of the detergent box 56 together with the water to be put in the drum 74 holding the laundry.

[0064] Accordingly, an assembly of supplying a detergent in a washing machine has the following advantages or effects.

[0065] First of all, the location correction protrusion provided at one side of the receiving part is inserted in the location correction recess formed at the drawer panel, whereby the detergent box can be correctly inserted in the receiving part.

[0066] Therefore, there exists no step difference between the drawer panel and the control panel, whereby a continuous exterior is enhanced. Moreover, the detergent box is accurately received to supply the detergent smoothly.

[0067] It will be apparent to those skilled in the art that various modifications and variations can be made in the present invention without departing from the spirit or scope of the invention. Thus, it is intended that the present invention cover such modifications and variations, provided they come within the scope of the appended claims and their equivalents.